

# **MAY M. WU, Ph.D.**

## **SUMMARY**

Experienced R&D researcher and engineer in national research institutes and specialty chemical industry. Solid background and knowledge in biotechnology and environmental science with specialty in water and wastewater treatment. Broad-based training in statistics, modeling, analytical instrumentation, emulsion chemistry, and membrane separation. Strong in laboratory and pilot scale testing. Good organizational and time management skills. A versatile, detail, systematic quick learner, who communicates effectively, and has provided excellent training in a short frame.

## **PROFESSIONAL EXPERIENCE**

### **ARGONNE NATIONAL LABORATORY, Argonne, IL**

**2004 –**

#### **Environmental Scientist**

Conduct analysis of energy consumption and emissions during production and utilization of transportation fuels from varies feed stocks with a team of multi-disciplinary scientists. Provide assessment for new technology RD&D and fuel/chemical production from renewable feed stocks.

### **NALCO CHEMICAL COMPANY, Naperville, IL**

**1998 – 2003**

#### **Senior Research Microbiologist**

**2000 – 2003**

- Successfully developed a surfactant based on-line low-toxic biofouling control program for reverse osmosis membrane in a team effort to reduce CIP of a 30MM market resulting 2 US patents.
- Initiated communication, which led to a collaboration research effort with Degremont and CIRSEE, evaluated Bioactive filtration in industrial water resulting a Nalco Global Research Award (2000, Nalco).
- Investigated various polymer techniques for biofouling prevention in water, co-developed a unique polymer formulation that demonstrated 40% improvement in biofouling prevention in pilot cooling tower resulting two invention disclosures.
- Developed methodology to analyze and monitor microbial activity in membrane bioreactor in a team effort to screen polymer product for flux enhancement and provided technical support.

#### **Senior Microbiologist**

**1998 – 2000**

- Formulated, characterized, and tested a heat stable biocide emulsion to target biofouling in cooling system surface, resulting a patent and a Nalco Global Research Award (1998, Nalco).
- Discovered a method for biocide emulsion dose control in water system to eliminate biocide under- or over- dose resulting in an invention disclosure.

### **ARGONNE NATIONAL LABORATORY, Argonne, IL**

**1994 – 1997**

#### **Postdoctoral Fellow, Special Term Appointment**

- Developed methodology and conducted test to monitor and control a succinic acid fermentation process with a proprietary microbial strain to develop a process for production of chemicals from biologically derived succinat acid. Received R & D 100 Award (1997)
- Evaluated various potential non-toxic film forming corrosion inhibitors for microbially influenced corrosion control in oil-gas production and storage field.
- Participated development of fuel cycle energy use and greenhouse gases an emission model to evaluate corn ethanol as alternative fuel for state of Illinois.
- Designed a laboratory hydraulic automated testing apparatus to simulate a year of cleaning-in-place (CIP) operation in few weeks to investigate long term membrane stability, established protocol, conducted test with project team.
- Conducted R&D targeting at recovery and recycle of chemicals from process waste stream using electrodialysis membrane in a pilot scale ED unit sponsored by chemical companies.

**MICHIGAN BIOTECHNOLOGY INSTITUTE/MICHIGAN STATE UNIVERSITY 1989 – 1994**

East Lansing, MI

**Research Assistant**

- Developed a monitoring and control technology based on trace gas (H<sub>2</sub> and CO) monitoring in Upflow Anaerobic Sludge Blanket (UASB) Reactor for early detection of process upset. Conducted statistical time series analysis.

**SHANGHAI MUNICIPAL ENGINEERING DESIGN INSTITUTE, Shanghai, China 1983– 1987****Process Manager**

Principle process design for water treatment plant. Responsible for site survey and evaluation, proposal submitting, and coordinate with structural, electrical, architectural design.

**Process Design Engineer**

Water treatment plant design. Participated ten plus projects in China.

**EDUCATION**

**Ph.D.**, Environmental Engineering and Environmental Toxicology, Michigan State University - East Lansing, Michigan

**M.S.**, Civil and Environmental Engineering, North Carolina State University - Raleigh, North Carolina

**B.E.**, Civil and Environmental Engineering, Tong-Ji University - Shanghai, China

**PATENTS**

- Method of controlling biofouling in aqueous media using antimicrobial emulsions (US6096225)
- Method of monitoring biofouling in membrane separation systems (US6699684)
- Method for locating hidden microorganism contaminated surfaces in industrial water systems (US6818417)
- 9 Records of inventions (Nalco)

**PUBLICATIONS/PRESENTATIONS**

May Wu, Role of bisulfite in reverse osmosis membrane biofouling monitoring and control with Biosensar, *Nalco research report*, Sept. 2003

Co-author, Technical Evaluation of Superbrom, *Nalco research report*, 2001

5 Technical presentations in Nalco Global Microbial Conference during 1998-2001

6+ technical posters in Nalco Research Technical Symposium during 1998-2003

M. Wang, C. Saricks, M. Wu, Fuel Ethanol Produced from US Midwest Corn: Help or Hindrance to the Vision of Kyoto? *Journal of AWWA*, Vol.49, pp756-772, July 1999

M. Wang, C. Saricks, M. Wu, Fuel-Cycle Fossil Energy Use and Greenhouse Gas Emissions of Fuel Ethanol Produced from US Midwest Corn, Center of Transportation Research, Argonne National Laboratory, *Research Reports to DCCA of IL*, 1998

J. Frank, E. St. Martin, D. Pope, J. Lin, M. Wu, Aspects of the Biocatalysis of Corrosion, presented at *Biocatalysis-98*, Puschina, Russia, June 13-18, 1998

May Wu, Robert Hickey, A Dynamic Model Including Reactor Hydraulics, Degradation and Diffusion for UASB Reactors, *J.Environmental Engineering*, Vol.123, No.3, 1997

Michael V. Enzien, Dan H. Pope, May M. Wu and Jim Frank, Nonbiocidal Control of Microbiologically Influenced Corrosion Using Organic Film-forming Inhibitors, *NACE international Annual Conference*, paper No. 290, Mar.1996, Houston Texas

May Wu, Robert Hickey, N-Propanol Production During Ethanol Degradation Using Anaerobic Granules, *Water Research*, Vol.30, No.7, pp1686-1694, 1996

May Wu, Craig Criddle, Robert Hickey, Mass Transfer and Temperature Effect on Substrate Utilization in Brewery Granules, *Biotechnology and Bioengineering*, Vol.46, 1995

May Wu, Robert Hickey, Thomas Voice, Hydraulic Characteristics of a UASB Reactor with Brewery Granules, Presented at *47th Purdue Industrial Waste Conference*, West Lafayette, IN, 1992